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Appendix C.

Traffic Operational Analysis

Great Road Traffic Optimization Study

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Appendix C. Traffic Operational Analysis

2022/2029/2040

This appendix provides the traffic operational analysis completed for the following weekday AM and PM peak hour scenarios:

- 2022 Existing
- 2029 Interim (No-Build and with Mitigation)
- 2040 Future (No-Build and with Mitigation)

1. Traffic Count Data

Automatic Traffic Recorder (ATR) and turning movement counts (TMCs) were gathered in October 2021. The ATRs included speed, volume, and vehicle class data and were collected at three locations[1] within the study corridor over a two-week period. The TMCs were collected at each of the 11 study intersections for two 13-hour weekday periods. The counts serve as the basis for adjusted and forecasted volumes used to analyze existing and proposed traffic operation conditions, as well as to perform signal warrant analyses, in accordance with the 2009 edition (revisions 1 and 2) of the Manual on Uniform Traffic Control Devices (MUTCD). Traffic count data are presented in Appendix E.

The peak hours for each project area intersection were determined based on the TMCs. It was concluded that for each intersection on the eastern side of the project corridor (Hillside Ave to Shawsheen Road) traffic volumes during the Midday peak hour were higher than the AM peak hour. As a result, traffic volumes from the Midday peak hour (11:45AM to 12:45AM) were used for the "Weekday AM Peak Hour" traffic analyses for the study intersections between Hillside Ave and Shawsheen Road to provide a conservative analysis. For the study intersections on the western side of the project corridor, the AM peak hour generally occurs between 7:15 AM and 8:15 AM. The PM peak hour generally occurs between 4:45 PM and 5:45 PM for all study intersections.

2. Base Year (2022) Traffic Volumes

Base year traffic volumes represent an average month during the year for which the traffic counts were conducted. Traffic network figures that show the base year volumes are provided for reference. The 2021 Traffic Volumes were factored up by 1.005 to represent 2022 base traffic volumes.

2.1 Seasonal Factors

The seasonal adjustment factor for an urban minor arterial in October is 0.94 based on published 2019 MassDOT Seasonal Correction Factors. This indicates traffic volumes in the month of October are

[1] Between Willson Park and Mudge Way, between Lane Avenue and Sunset Road, and between Stop&Shop Plaza and Shawsheen Avenue.

approximately 6% higher than the average month. To provide a conservative analysis, no seasonal adjustment factor was applied to the October 2021 traffic volumes.

2.2 COVID Adjustments

To account for potential impacts from the COVID-19 pandemic on 2021 traffic volumes we reviewed historical traffic count data from a nearby MassDOT continuous traffic count station (Station ID 4159) located on I-95 in Woburn. The data indicates that 2021 traffic volumes were approximately 1.67% lower than 2019 pre-COVID traffic volumes. As a result, a COVID adjustment factor of 1.0167 was applied to the October 2021 traffic volumes.

2.3 Development Projections

Staff at the Town of Bedford indicated that there are no planned developments that are anticipated to substantially change traffic patterns.

This study coordinated with the Hartwell Avenue Plan in Lexington as much as possible to account for growth that may impact Great Road. As of September 2022, several questions and assumptions were yet to be determined for the Hartwell Avenue Plan. Any information shared by Lexington is considered "draft" and may ultimately differ from the final plan. Therefore, the Great Road Traffic Optimization Study may eventually need to be revisited depending on the outcome of the Hartwell Avenue Plan. But as the Lexington plan expects the majority of Hartwell Avenue traffic to use Interstate 95, impacts to Great Road will likely be small.

3. Interim (2029) and Future (2040) Year Traffic Volumes

Based on discussions with Town of Bedford Planning staff, an interim year of 2029 and a future year of 2040 were selected to provide both intermediate and long-term estimates of future conditions.

3.1 Annual Background Growth Rate

A background growth rate to be used when forecasting future traffic volumes was discussed with the Central Transportation Planning Staff (CTPS) of the Boston Regional Metropolitan Planning Organization. The metropolitan planning organization (MPO) recommended an annual average growth rate of 0.09% based on the projected growth in the Town of Bedford between 2016-2040. To provide a conservative analysis, an annual average growth rate of 0.5% was adopted.

The 2029 and 2040 traffic volumes were developed by applying the 0.5% annual background growth rate to the Base Year Condition peak-hour traffic volumes over the 7-year and 18-year design horizons.

4. Operational Analysis

4.1 Capacity Analysis

The Highway Capacity Manual (HCM) from the Federal Highway Administration (FHWA) provides guidance and analysis methodologies that are used to calculate performance levels for roadways and intersections (signalized and unsignalized). Level of Service (LOS) is a term used to denote different operating conditions that occur under various traffic volume loads. It is a *qualitative measure* of vehicle traffic

operations affected by factors including geometrics, speed, travel delay, freedom to maneuver, and safety. Specifically, LOS criteria are quantified, in terms of average control delay per vehicle for the peak hour, for the entire intersection and by approach.

The LOS is divided into a range of six letter grades, with A being the least vehicle delay and F being the most vehicle delay. LOS E and F are generally considered inadequate for traffic operations. Since the level of service of a traffic facility is a function of the traffic flows placed upon it, such a facility may operate at a wide range of levels of service depending on the time of day, day of week, or period of year. A description of the operating condition under each level of service is provided below:

- LOS A – little to no delay to motorists
- LOS B – relatively low delay to motorists
- LOS C – average delays to motorists
- LOS D – congestion becomes more noticeable, delays are still within an acceptable range
- LOS E – high level of delay, considered by many agencies to be the limit of acceptable delay
- LOS F – unacceptable delays that often occur, arrival flow rates often exceed the intersection capacity

LOS designation is reported differently for signalized and unsignalized intersections. For signalized intersections, it is defined in terms of delay, which is a measure of driver discomfort and frustration, fuel consumption, and lost travel time. For unsignalized intersections, the analysis assumes that through traffic is not affected by traffic on the side street. The LOS for each movement is calculated by determining the length of gaps that are available in the conflicting traffic stream. Based upon the length of the gaps between vehicles, the capacity of the movement can be calculated. The demand is then compared to the capacity and utilized to determine the average control delay for the movement. For unsignalized intersections, an overall intersection LOS is not determined. It is generally reported in terms of delay for left turns on the mainline and all side street movements.

The delay ranges differ slightly between unsignalized and signalized intersections due to driver expectations and behavior. It should be noted that the HCM 2010 considers any v/c ratio >1.0 to be equal to LOS F, regardless of the control delay. Thresholds for vehicular LOS criteria for signalized intersections are shown in Table 1.

MassDOT strives for the best LOS possible and indicates intersection LOS of LOS D can be acceptable for urban areas, in accordance with AASHTO guidelines. The traffic volumes in this report are assumed to represent the travel demand observed and "capacity" represents the amount of traffic the intersection can accommodate. Intersection performance measures can also be calculated in the form of volume to capacity (v/c) ratio, average vehicular delay, average and 95th percentile queue lengths, and level-of-service (LOS).

The v/c ratio is a measure of congestion using the amount of traffic compared to the available capacity. This measure can be reported for individual approaches or the intersection as a whole. As opposed to delay there is no standard gauge to provide a specific point of reference for a certain volume-to-capacity ratio. However, a lower volume-to-capacity ratio indicates that congestion is less likely. As the ratio approaches and exceeds 1.00 congestion is more likely to occur. A ratio below 1.00 is considered

acceptable. 95th percentile queue lengths are also examined to determine if extensive queue lengths exist that may impede operations elsewhere by extending into adjacent intersections or other conflict areas.

Synchro 11 was the primary software used to analyze the intersections and is the preferred MassDOT software program.

Table 1 - Level of Service Criteria for Intersections

Level of Service	Signalized Intersection Control Delay Ranges (seconds/vehicle)	Un-signalized Intersection Control Delay Ranges (seconds/vehicle)
A	≤10	≤10
B	>10 to ≤15	>10 to ≤20
C	>15 to ≤25	>20 to ≤35
D	>25 to ≤35	>35 to ≤55
E	>35 to ≤50	>55 to ≤80
F	>50	>80
Source: *Highway Capacity Manual 6th Edition: A Guide for Multimodal Mobility Analysis* Transportation Research Board; Washington, D.C.; 2016.		

4.1.1 Peak Hour Factor (PHF)

All intersection approaches were evaluated based on the peak 15 minutes of data collected during the peak hour. The PHF was applied on an approach-by-approach basis for analysis of base year traffic volumes. A PHF of 0.92 was used for the future traffic volumes on this project.

4.1.2 Heavy Vehicle Percentage

The traffic volume data used in the analysis includes the percentage of heavy vehicles reflected in the actual TMC data. The percentage has been applied on an approach-by-approach basis. Heavy Vehicle percentages identified in the TMCs counts are shown on the Turning Movement Counts in Appendix E.

4.1.3 Pedestrian Phase

The signalized intersections within the study area use exclusive pedestrian phasing. Concurrent phasing is recommended by this study.

4.1.4 Analysis Scenarios

To assess the quality of traffic flow, capacity and queue analyses were analyzed for the following weekday AM and PM peak hour scenarios:

- 2022 Existing
- 2029 Interim (No-Build and with Mitigation)

- 2040 Future (No-Build and with Mitigation)

4.2 Capacity Analysis Results

This section summarizes the results for each of the eleven intersections. The intersection analysis worksheets and detailed results are included in Appendix F. The highlights of these results are discussed in Section 5 of the memorandum.

1. Great Road at Shawsheen Road

Signalized - Existing		2022 Existing - AM Peak					2022 Existing - PM Peak				
Intersection	Movement	Delay (sec)	50% Queue (ft)	95% Queue (ft)	v/c[1]	LOS[2]	Delay (sec)	50% Queue (ft)	95% Queue (ft)	v/c[1]	LOS[2]
Great Road at Shawsheen Road	NB LTR	19.9	21	55	0.23	B	20.1	10	33	0.11	C
	SB LTR	70.3	133	380	0.95	E	42.6	93	236	0.72	D
	EB LTR	17.0	179	593	0.66	B	17.3	189	601	0.68	B
	WB LT	22.1	219	718	0.79	C	23.2	244	725	0.81	C
	WB R	4.0	6	49	0.17	A	4.5	19	90	0.36	A
	Total	**26.1**				**C**	**20.0**				**C**

Signalized - Existing		2029 Interim No-Build - AM Peak					2029 Interim w/ Mitigation - AM Peak				
Intersection	Movement	Delay (sec)	50% Queue (ft)	95% Queue (ft)	v/c[1]	LOS[2]	Delay (sec)	50% Queue (ft)	95% Queue (ft)	v/c[1]	LOS[2]
Great Road at Shawsheen Road	NB LTR	19.4	16	64	0.20	B	21.2	18	59	0.30	C
	SB LTR	67.0	131	392	0.93	E	39.0	115	255	0.78	D
	EB LTR	18.5	197	646	0.70	B	21.2	245	606	0.74	C
	WB LT	24.6	239	762	0.82	C	30.0	298	715	0.87	C
	WB R	4.2	7	51	0.17	A	1.3	0	17	0.14	A
	Total	**26.8**				**C**	**25.6**				**C**

Signalized - Existing		2029 Interim No-Build - PM Peak					2029 Interim w/ Mitigation - PM Peak				
Intersection	Movement	Delay (sec)	50% Queue (ft)	95% Queue (ft)	v/c[1]	LOS[2]	Delay (sec)	50% Queue (ft)	95% Queue (ft)	v/c[1]	LOS[2]
Great Road at Shawsheen Road	NB LTR	20.2	8	33	0.11	C	23.9	10	37	0.22	C
	SB LTR	43.4	85	250	0.72	D	32.8	79	160	0.63	C
	EB LTR	16.2	177	617	0.65	B	15.9	168	572	0.66	B
	WB LT	20.5	219	747	0.77	C	20.7	208	695	0.78	C
	WB R	4.2	16	96	0.35	A	1.1	0	24	0.26	A
	Total	**18.6**				**B**	**17.0**				**B**

Signalized – Existing		2040 No-Build – AM Peak					2040 w/ Mitigation – AM Peak				
Intersection	Movement	Delay (sec)	50% Queue (ft)	95% Queue (ft)	v/c[1]	LOS[2]	Delay (sec)	50% Queue (ft)	95% Queue (ft)	v/c[1]	LOS[2]
Great Road at Shawsheen Road	NB LTR	18.6	16	64	0.19	B	61.5	46	97	0.62	E
	SB L	-	-	-	-	-	63.0	186	449	0.80	E
	SB TR	-	-	-	-	-	18.9	9	47	0.12	B
	SB LTR	69.5	138	411	0.95	E	-	-	-	-	-
	EB LTR	29.0	300	914	0.89	C	8.8	168	178	0.76	A
	WB LT	29.9	280	858	0.90	C	23.2	575	741	0.79	C
	WB R	4.5	9	57	0.18	A	0.7	1	12	0.13	A
	Total	**32.6**				**C**	**21.6**				**C**

Signalized – Existing		2040 No-Build -PM Peak					2040 w/ Mitigation – PM Peak				
Intersection	Movement	Delay (sec)	50% Queue (ft)	95% Queue (ft)	v/c[1]	LOS[2]	Delay (sec)	50% Queue (ft)	95% Queue (ft)	v/c[1]	LOS[2]
Great Road at Shawsheen Road	NB LTR	20.1	8	39	0.10	C	36.6	13	43	0.33	D
	SB L	-	-	-	-	-	45.8	90	223	0.67	D
	SB TR	-	-	-	-	-	16.3	6	33	0.11	B
	SB LTR	42.8	90	269	0.72	D	-	-	-	-	-
	EB LTR	20.8	226	743	0.77	C	11.1	458	593	0.65	B
	WB LT	35.4	339	972	0.94	D	23.0	436	786	0.84	C
	WB R	5.4	27	127	0.37	A	1.0	4	19	0.28	A
	Total	**26.2**				**C**	**17.5**				**B**

2. Great Road at Stop&Shop Plaza

Signalized – Existing		2022 Existing – AM Peak					2022 Existing – PM Peak				
Intersection	Movement	Delay (sec)	50% Queue (ft)	95% Queue (ft)	v/c[1]	LOS[2]	Delay (sec)	50% Queue (ft)	95% Queue (ft)	v/c[1]	LOS[2]
Great Road at Stop&Shop Plaza	EB L	18.0	0	4	0.00	B	20.0	0	5	0.00	B
	EB T	24.3	231	718	0.64	C	25.3	236	790	0.66	C
	EB R	7.9	23	114	0.26	A	9.0	18	99	0.20	A
	WB L	23.1	40	184	0.53	C	20.5	30	161	0.44	C
	WB TR	17.0	166	649	0.55	B	16.5	155	713	0.56	B
	NB LT	55.4	109	338	0.72	E	53.1	92	254	0.69	D
	NB R	6.8	8	84	0.38	A	5.3	0	48	0.29	A
	SB LTR	32.9	7	23	0.07	C	38.0	2	4	0.01	D
	Total	**21.1**				**C**	**21.2**				**C**

Signalized - Existing		2029 Interim No-Build - AM Peak					2029 Interim w/ Mitigation - AM Peak				
Intersection	Movement	Delay (sec)	50% Queue (ft)	95% Queue (ft)	v/c[1]	LOS[2]	Delay (sec)	50% Queue (ft)	95% Queue (ft)	v/c[1]	LOS[2]
Great Road at Stop&Shop Plaza	EB L	19.0	0	4	0.00	B	13.0	0	3	0.00	B
	EB T	28.7	299	829	0.73	C	23.9	260	544	0.74	C
	EB R	9.1	32	132	0.29	A	3.5	4	48	0.28	A
	WB L	29.0	44	244	0.59	C	14.4	38	114	0.62	B
	WB TR	17.6	190	786	0.59	B	10.9	166	364	0.58	B
	NB LT	63.4	126	367	0.80	E	51.8	99	236	0.78	D
	NB R	7.6	15	104	0.38	A	4.6	5	57	0.37	A
	SB LTR	34.9	5	29	0.05	C	24.6	4	20	0.05	C
	Total	**24.1**				**C**	**17.2**				**C**

Signalized - Existing		2029 Interim No-Build - PM Peak					2029 Interim w/ Mitigation - PM Peak				
Intersection	Movement	Delay (sec)	50% Queue (ft)	95% Queue (ft)	v/c[1]	LOS[2]	Delay (sec)	50% Queue (ft)	95% Queue (ft)	v/c[1]	LOS[2]
Great Road at Stop&Shop Plaza	EB L	20.0	0	5	0.00	B	13.0	0	3	0.00	B
	EB T	25.7	243	818	0.68	C	19.3	206	513	0.66	B
	EB R	9.2	20	103	0.21	A	3.2	1	39	0.20	A
	WB L	21.3	30	169	0.46	C	8.5	25	79	0.47	A
	WB TR	16.7	161	794	0.58	B	9.7	139	363	0.55	A
	NB LT	53.8	90	263	0.69	D	45.3	79	162	0.69	D
	NB R	5.3	0	55	0.28	A	4.2	0	42	0.28	A
	SB LTR	40.0	0	7	0.00	D	27.0	0	5	0.00	C
	Total	**21.4**				**C**	**14.5**				**B**

Signalized - Existing		2040 No-Build - AM Peak					2040 w/ Mitigation - AM Peak				
Intersection	Movement	Delay (sec)	50% Queue (ft)	95% Queue (ft)	v/c[1]	LOS[2]	Delay (sec)	50% Queue (ft)	95% Queue (ft)	v/c[1]	LOS[2]
Great Road at Stop&Shop Plaza	EB L	19.0	0	4	0.00	B	11.0	0	0	0.00	B
	EB T	42.3	446	1167	0.92	D	22.6	528	910	0.84	C
	EB R	11.1	45	164	0.31	B	4.3	13	104	0.28	A
	WB L	67.5	104	410	0.89	E	47.7	176	248	0.82	D
	WB TR	18.9	221	914	0.65	B	14.6	303	498	0.59	B
	NB LT	68.3	135	393	0.84	E	71.4	178	346	0.81	E
	NB R	8.4	21	119	0.41	A	11.4	51	138	0.42	B
	SB LTR	35.2	6	29	0.05	D	35.5	7	27	0.05	D
	Total	**33.4**				**C**	**23.9**				**C**

Signalized - Existing		2040 No-Build - PM Peak					2040 w/ Mitigation - PM Peak				
Intersection	Movement	Delay (sec)	50% Queue (ft)	95% Queue (ft)	v/c[1]	LOS[2]	Delay (sec)	50% Queue (ft)	95% Queue (ft)	v/c[1]	LOS[2]
Great Road at Stop&Shop Plaza	EB L	20.0	0	5	0.01	B	11.0	0	1	0.00	B
	EB T	29.3	304	939	0.76	C	21.3	334	604	0.69	C
	EB R	10.2	25	115	0.22	B	5.9	40	66	0.20	A
	WB L	28.4	34	182	0.56	C	10.1	29	72	0.54	B
	WB TR	20.5	254	1128	0.73	C	15.4	434	645	0.68	B
	NB LT	54.0	98	284	0.70	D	52.7	100	170	0.74	D
	NB R	5.2	0	56	0.29	A	4.3	0	44	0.30	A
	SB LTR	40.0	0	7	0.00	D	28.0	1	5	0.00	C
	Total	**24.4**				**C**	**17.9**				**B**

3. Great Road & Brooksbie Road

Unsignalized - Existing		2022 Existing - AM Peak				2022 Existing - PM Peak			
Intersection	Movement	Delay (sec)	95% Queue (ft)	v/c[1]	LOS[2]	Delay (sec)	95% Queue (ft)	v/c[1]	LOS[2]
Great Road & Brooksbie Road	SB L	295.4	70	0.83	F	758.4	115	1.73	F
	SB R	34.1	118	0.68	D	42.0	193	0.82	E
	EB L	12.5	40	0.35	B	14.4	78	0.52	B
	EB T	0.0	0	-	A	0.0	0	-	A
	WB T	0.0	0	-	A	0.0	0	-	A
	WB R	0.0	0	-	A	0.0	0	-	A
	Total	**8.3**			**A**	**19.5**			**C**

Unsignalized - Existing		2029 Interim No-Build - AM Peak				2029 Interim w/ Mitigation - AM Peak			
Intersection	Movement	Delay (sec)	95% Queue (ft)	v/c[1]	LOS[2]	Delay (sec)	95% Queue (ft)	v/c[1]	LOS[2]
Great Road & Brooksbie Road	SB L	371.6	78	0.97	F	371.6	78	0.97	F
	SB R	35.5	128	0.70	E	35.5	128	0.70	E
	EB L	12.7	43	0.37	B	12.7	43	0.37	B
	EB T	0.0	0	-	A	0.0	0	-	A
	WB T	0.0	0	-	A	0.0	0	-	A
	WB R	0.0	0	-	A	0.0	0	-	A
	Total	**9.3**			**A**	**9.3**			**A**

Unsignalized - Existing		2029 Interim No-Build - PM Peak				2029 Interim w/ Mitigation - PM Peak			
Intersection	Movement	Delay (sec)	95% Queue (ft)	v/c[1]	LOS[2]	Delay (sec)	95% Queue (ft)	v/c[1]	LOS[2]
Great Road & Brooksbie Road	SB L	916.5	110	1.90	F	916.5	110	1.90	F
	SB R	33.3	145	0.73	D	33.3	145	0.73	D
	EB L	15.3	90	0.56	C	15.3	90	0.56	C
	EB T	0.0	0	-	A	0.0	0	-	A
	WB T	0.0	0	-	A	0.0	0	-	A
	WB R	0.0	0	-	A	0.0	0	-	A
	Total	**18.3**			**C**	**18.3**			**C**

Unsignalized - Existing		2040 No-Build - AM Peak				2040 w/ Mitigation - AM Peak				
Intersection	Movement	Delay (sec)	95% Queue (ft)	v/c[1]	LOS[2]	Delay (sec)	50% Queue (ft)	95% Queue (ft)	v/c[1]	LOS[2]
Great Road & Brooksbie Road	SB L	859.1	103	1.77	F	-		-	-	-
	SB R	51.2	175	0.82	F	-		-	-	-
	SB LR	-	-	-	-	27.5	23	118	0.81	C
	EB L	13.9	53	0.42	B	18.4	31	180	0.65	B
	EB T	0.0	0	-	A	8.2	103	469	0.69	A
	WB T	0.0	0	-	A	12.4	257	519	0.70	B
	WB R	0.0	0	-	A	0.5	1	5	0.06	A
	Total	**15.6**			**C**	**12.6**				**B**

Unsignalized - Existing		2040 No-Build - PM Peak				2040 w/ Mitigation - PM Peak				
Intersection	Movement	Delay (sec)	95% Queue (ft)	v/c[1]	LOS[2]	Delay (sec)	50% Queue (ft)	95% Queue (ft)	v/c[1]	LOS[2]
Great Road & Brooksbie Road	SB L	2597.2	133	4.50	F	-		-	-	-
	SB R	81.1	268	0.98	F	-		-	-	-
	SB LR	-	-	-	-	18.8	17	99	0.78	B
	EB L	22.0	143	0.70	C	44.5	222	453	0.91	D
	EB T	0.0	0	-	A	7.9	347	140	0.59	A
	WB T	0.0	0	-	A	49.7	562	761	0.96	D
	WB R	0.0	0	-	A	6.1	36	36	0.13	A
	Total	**43.0**			**E**	**29.2**				**C**

4. Great Road & Loomis Street

Signalized - Existing		2022 Existing - AM Peak					2022 Existing - PM Peak				
Intersection	Movement	Delay (sec)	50% Queue (ft)	95% Queue (ft)	v/c[1]	LOS[2]	Delay (sec)	50% Queue (ft)	95% Queue (ft)	v/c[1]	LOS[2]
Great Road & Loomis Street	NB LT	45.9	30	118	0.41	D	42.8	28	93	0.41	D
	NB R	5.2	0	39	0.30	A	6.6	18	47	0.54	A
	SB LTR	0.7	0	0	0.12	A	0.9	0	0	0.15	A
	EB L	7.3	2	16	0.05	A	8.6	1	10	0.03	A
	EB TR	16.4	126	327	0.50	B	21.6	119	300	0.56	C
	WB L	8.1	21	97	0.35	A	9.3	37	129	0.46	A
	WB TR	17.1	186	967	0.69	B	16.1	186	662	0.68	B
	Total	**15.8**				**B**	**15.8**				**B**

Signalized - Existing		2029 Interim No-Build - AM Peak					2029 Interim w/ Mitigation - AM Peak				
Intersection	Movement	Delay (sec)	50% Queue (ft)	95% Queue (ft)	v/c[1]	LOS[2]	Delay (sec)	50% Queue (ft)	95% Queue (ft)	v/c[1]	LOS[2]
Great Road & Loomis Street	NB LT	47.2	35	119	0.42	D	25.8	22	63	0.36	C
	NB R	5.2	0	41	0.31	A	11.6	26	72	0.35	B
	SB LTR	0.7	0	0	0.12	A	0.7	0	0	0.12	A
	EB L	7.3	2	17	0.06	A	12.4	4	17	0.07	B
	EB TR	16.6	145	365	0.53	B	13.8	121	210	0.57	B
	WB L	8.4	22	99	0.37	A	5.8	18	46	0.35	A
	WB TR	17.0	196	990	0.68	B	8.5	159	366	0.62	A
	Total	**15.9**				**B**	**11.1**				**B**

Signalized - Existing		2029 Interim No-Build - PM Peak					2029 Interim w/ Mitigation - PM Peak				
Intersection	Movement	Delay (sec)	50% Queue (ft)	95% Queue (ft)	v/c[1]	LOS[2]	Delay (sec)	50% Queue (ft)	95% Queue (ft)	v/c[1]	LOS[2]
Great Road & Loomis Street	NB LT	40.2	21	100	0.35	D	14.7	16	43	0.22	B
	NB R	4.6	4	63	0.45	A	13.9	54	123	0.61	B
	SB LTR	0.4	0	0	0.08	A	0.4	0	0	0.08	A
	EB L	8.4	1	10	0.02	A	11.9	2	10	0.04	B
	EB TR	21.6	117	299	0.60	C	14.6	86	149	0.61	B
	WB L	8.6	28	133	0.41	A	6.7	24	61	0.44	A
	WB TR	13.9	132	700	0.60	B	7.7	113	267	0.56	A
	Total	**15.0**				**B**	**11.1**				**B**

Signalized - Existing		2040 No-Build - AM Peak					2040 w/ Mitigation - AM Peak				
Intersection	Movement	Delay (sec)	50% Queue (ft)	95% Queue (ft)	v/c[1]	LOS[2]	Delay (sec)	50% Queue (ft)	95% Queue (ft)	v/c[1]	LOS[2]
Great Road & Loomis Street	NB LT	59.9	47	128	0.56	E	75.5	70	122	0.64	E
	NB R	5.6	0	41	0.37	A	23.8	65	127	0.47	C
	SB LTR	1.1	0	0	0.15	A	8.5	0	23	0.20	A
	EB L	7.2	2	17	0.07	A	6.9	2	9	0.06	A
	EB TR	16.3	186	505	0.53	B	7.6	114	230	0.46	A
	WB L	9.3	24	104	0.47	A	6.5	44	37	0.46	A
	WB TR	17.0	240	1144	0.71	B	6.9	274	165	0.65	A
	Total	**16.4**				**B**	**10.6**				**B**

Signalized - Existing		2040 No-Build - PM Peak					2040 w/ Mitigation - PM Peak				
Intersection	Movement	Delay (sec)	50% Queue (ft)	95% Queue (ft)	v/c[1]	LOS[2]	Delay (sec)	50% Queue (ft)	95% Queue (ft)	v/c[1]	LOS[2]
Great Road & Loomis Street	NB LT	54.0	33	105	0.51	D	50.2	37	75	0.53	D
	NB R	8.9	22	89	0.61	A	29.5	146	191	0.75	C
	SB LTR	0.7	0	0	0.11	A	1.0	0	0	0.12	A
	EB L	7.8	1	11	0.03	A	14.2	3	6	0.03	B
	EB TR	15.9	121	340	0.42	B	15.6	112	262	0.41	B
	WB L	9.1	32	144	0.49	A	3.1	7	56	0.45	A
	WB TR	15.6	211	1104	0.70	B	7.2	28	595	0.66	A
	Total	**14.9**				**B**	**13.9**				**B**

5. Great Road at Bedford Marketplace Plaza

Signalized - Existing		2022 Existing - AM Peak					2022 Existing - PM Peak				
Intersection	Movement	Delay (sec)	50% Queue (ft)	95% Queue (ft)	v/c[1]	LOS[2]	Delay (sec)	50% Queue (ft)	95% Queue (ft)	v/c[1]	LOS[2]
Great Road at Bedford Marketplace Plaza	SB L	37.4	108	312	0.62	D	32.4	54	166	0.46	C
	SB R	9.1	0	42	0.21	A	10.7	0	37	0.17	B
	EB L	8.1	5	26	0.15	A	7.4	4	26	0.12	A
	EB T	15.1	150	426	0.68	B	11.3	93	330	0.54	B
	WB T	25.3	225	595	0.81	C	20.3	173	493	0.72	C
	WB R	10.2	45	140	0.37	B	8.8	25	94	0.24	A
	Total	**20.3**				**C**	**16.4**				**B**

Signalized - Existing		2029 Interim No-Build - AM Peak					2029 Interim w/ Mitigation – AM Peak				
Intersection	Movement	Delay (sec)	50% Queue (ft)	95% Queue (ft)	v/c[1]	LOS[2]	Delay (sec)	50% Queue (ft)	95% Queue (ft)	v/c[1]	LOS[2]
Great Road at Bedford Marketplace Plaza	SB L	38.9	110	320	0.64	D	24.2	69	155	0.57	C
	SB R	9.3	0	45	0.22	A	5.9	0	30	0.20	A
	EB L	8.1	6	27	0.15	A	6.7	5	17	0.14	A
	EB T	15.6	165	470	0.70	B	15.1	150	302	0.74	B
	WB T	24.6	234	618	0.80	C	25.9	147	462	0.83	C
	WB R	10.1	47	145	0.37	B	0.6	0	10	0.21	A
	Total	**20.3**				**C**	**17.3**				**B**

Signalized - Existing		2029 Interim No-Build - PM Peak					2029 Interim w/ Mitigation - PM Peak				
Intersection	Movement	Delay (sec)	50% Queue (ft)	95% Queue (ft)	v/c[1]	LOS[2]	Delay (sec)	50% Queue (ft)	95% Queue (ft)	v/c[1]	LOS[2]
Great Road at Bedford Marketplace Plaza	SB L	33.6	61	176	0.50	C	21.4	39	99	0.44	C
	SB R	10.5	0	37	0.18	B	6.6	0	24	0.17	A
	EB L	7.5	5	26	0.13	A	5.5	4	16	0.12	A
	EB T	11.7	104	352	0.56	B	10.1	87	211	0.58	B
	WB T	20.8	189	561	0.73	C	19.9	102	408	0.74	B
	WB R	8.9	27	99	0.25	A	0.6	0	9	0.15	A
	Total	**16.9**				**B**	**13.6**				**B**

Signalized - Existing		2040 No-Build - AM Peak					2040 w/ Mitigation - AM Peak				
Intersection	Movement	Delay (sec)	50% Queue (ft)	95% Queue (ft)	v/c[1]	LOS[2]	Delay (sec)	50% Queue (ft)	95% Queue (ft)	v/c[1]	LOS[2]
Great Road at Bedford Marketplace Plaza	SB L	45.0	135	343	0.73	D	67.3	224	309	0.81	E
	SB R	9.3	0	45	0.24	A	9.0	0	45	0.26	A
	EB L	8.2	6	28	0.18	A	8.7	15	21	0.12	A
	EB T	21.1	250	774	0.83	C	20.7	623	472	0.69	C
	WB T	25.3	276	714	0.81	C	15.1	311	606	0.67	B
	WB R	10.1	53	158	0.36	B	0.8	17	3	0.22	A
	Total	**23.1**				**C**	**21.1**				**C**

Signalized - Existing		2040 No-Build - PM Peak					2040 w/ Mitigation - PM Peak				
Intersection	Movement	Delay (sec)	50% Queue (ft)	95% Queue (ft)	v/c[1]	LOS[2]	Delay (sec)	50% Queue (ft)	95% Queue (ft)	v/c[1]	LOS[2]
Great Road at Bedford Marketplace Plaza	SB L	44.3	84	190	0.65	D	46.7	99	161	0.66	D
	SB R	10.8	0	39	0.23	B	9.9	0	35	0.23	A
	EB L	7.7	5	27	0.16	A	7.1	10	16	0.13	A
	EB T	10.9	126	410	0.55	B	11.5	237	296	0.51	B
	WB T	23.2	297	814	0.80	C	10.8	71	373	0.73	B
	WB R	8.7	33	110	0.23	A	3.4	0	50	0.21	A
	Total	**18.8**				**B**	**13.4**				**B**

6. Great Road & Hillside Avenue

Unsignalized - Existing		2022 Existing - AM Peak				2022 Existing - PM Peak			
Intersection	Movement	Delay (sec)	95% Queue (ft)	v/c[1]	LOS[2]	Delay (sec)	95% Queue (ft)	v/c[1]	LOS[2]
Great Road & Hillside Avenue	NB LTR	20.7	8	0.10	C	29.8	25	0.26	D
	SB LTR	619.3	438	2.14	F	207.5	185	1.13	F
	EB L	9.5	3	0.02	A	9.3	3	0.26	D
	EB TR	0	0	-	-	0	0	-	-
	WB L	9.1	3	0.03	A	8.9	3	0.02	A
	WB TR	0	0	-	-	0	0	-	-
	Total	**70.3**			**F**	**16.0**			**C**

Unsignalized - Existing		2029 Interim No-Build - AM Peak				2029 Interim w/ Mitigation - AM Peak			
Intersection	Movement	Delay (sec)	95% Queue (ft)	v/c[1]	LOS[2]	Delay (sec)	95% Queue (ft)	v/c[1]	LOS[2]
Great Road & Hillside Avenue	NB LTR	21.1	8	0.09	C	21.1	8	0.09	C
	SB LTR	513.8	340	1.87	F	513.8	340	1.87	F
	EB L	9.7	3	0.02	A	9.7	3	0.02	A
	EB TR	0	0	-	-	0	0	-	-
	WB L	9.2	3	0.03	A	9.2	3	0.03	A
	WB TR	0	0	-	-	0	0	-	-
	Total	**46.2**			**E**	**46.2**			**E**

Unsignalized - Existing		2029 Interim No-Build - PM Peak				2029 Interim w/ Mitigation - PM Peak			
Intersection	Movement	Delay (sec)	95% Queue (ft)	v/c[1]	LOS[2]	Delay (sec)	95% Queue (ft)	v/c[1]	LOS[2]
Great Road & Hillside Avenue	NB LTR	31.3	23	0.24	D	31.3	23	0.24	D
	SB LTR	173.8	145	0.99	F	173.8	145	0.99	F
	EB L	9.5	3	0.02	A	9.5	3	0.02	A
	EB TR	0	0	-	-	0	0	-	-
	WB L	9.0	3	0.02	A	9.0	3	0.02	A
	WB TR	0	0	-	-	0	0	-	-
	Total	**10.9**			**B**	**10.9**			**B**

Unsignalized - Existing		2040 No-Build - AM Peak				2040 w/ Mitigation - AM Peak			
Intersection	Movement	Delay (sec)	95% Queue (ft)	v/c[1]	LOS[2]	Delay (sec)	95% Queue (ft)	v/c[1]	LOS[2]
Great Road & Hillside Avenue	NB LTR	27.7	10	0.13	D	28.8	10	0.13	D
	SB LTR	1106.5	443	3.10	F	1164.8	448	3.22	F
	EB L	10.1	3	0.02	B	-	-	-	-
	EB TR	0	0	-	-	-	-	-	-
	EB LTR	-	-	-	-	0.2	3	0.02	A
	WB L	10.0	3	0.04	A	-	-	-	-
	WB TR	0	0	-	-	-	-	-	-
	WB LTR	-	-	-	-	0.3	3	0.04	A
	Total	**90.6**			**F**	**95.4**			**F**

Unsignalized - Existing		2040 No-Build - PM Peak				2040 w/ Mitigation - PM Peak			
Intersection	Movement	Delay (sec)	95% Queue (ft)	v/c[1]	LOS[2]	Delay (sec)	95% Queue (ft)	v/c[1]	LOS[2]
Great Road & Hillside Avenue	NB LTR	47.0	35	0.35	E	49.5	38	0.37	E
	SB LTR	494.9	225	1.70	F	542.1	233	1.79	F
	EB L	10.3	3	0.03	B	-	-	-	-
	EB TR	0	0	-	-	-	-	-	-
	EB LTR	-	-	-	-	0.3	3	0.03	A
	WB L	9.2	3	0.03	A	-	-	-	-
	WB TR	0	0	-	-	-	-	-	-
	WB LTR	-	-	-	-	0.2	3	0.03	A
	Total	**26.7**			**D**	**29.2**			**D**

7. Great Road & South Road

Signalized - Existing		2022 Existing - AM Peak					2022 Existing - PM Peak				
Intersection	Movement	Delay (sec)	50% Queue (ft)	95% Queue (ft)	v/c[1]	LOS[2]	Delay (sec)	50% Queue (ft)	95% Queue (ft)	v/c[1]	LOS[2]
Great Road & South Road	NB L	20.5	79	105	0.59	C	28.7	135	339	0.78	C
	NB TR	10.8	25	40	0.16	B	12.1	32	89	0.17	B
	SB LTR	42.5	106	223	0.74	D	37.4	67	176	0.72	D
	EB LTR	164.8	487	1173	1.28	F	57.2	287	831	0.97	E
	WB LTR	41.2	228	602	0.85	D	46.1	269	780	0.90	D
	Total	**85.8**				**F**	**42.4**				**D**

Signalized - Existing		2029 Interim No-Build - AM Peak					2029 Interim w/ Mitigation - AM Peak				
Intersection	Movement	Delay (sec)	50% Queue (ft)	95% Queue (ft)	v/c[1]	LOS[2]	Delay (sec)	50% Queue (ft)	95% Queue (ft)	v/c[1]	LOS[2]
Great Road & South Road	NB L	17.8	45	121	0.40	B	32.6	74	128	0.58	C
	NB TR	10.4	13	50	0.11	B	16.1	21	54	0.13	B
	SB LTR	38.6	87	225	0.69	D	49.8	118	230	0.78	D
	EB LTR	146.1	457	1206	1.24	F	32.4	381	662	0.92	C
	WB LTR	30.3	164	608	0.70	C	14.1	155	236	0.52	B
	Total	**83.5**				**F**	**29.0**				**C**

Signalized - Existing		2029 Interim No-Build - PM Peak					2029 Interim w/ Mitigation - PM Peak				
Intersection	Movement	Delay (sec)	50% Queue (ft)	95% Queue (ft)	v/c[1]	LOS[2]	Delay (sec)	50% Queue (ft)	95% Queue (ft)	v/c[1]	LOS[2]
Great Road & South Road	NB L	27.6	130	353	0.76	C	41.3	139	347	0.88	D
	NB TR	12.0	31	91	0.17	B	12.3	31	71	0.18	B
	SB LTR	37.6	71	185	0.73	D	30.5	53	131	0.71	C
	EB LTR	66.4	299	871	1.00	E	30.0	228	426	0.85	C
	WB LTR	60.5	306	880	0.98	E	30.2	237	437	0.86	C
	Total	**50.0**				**D**	**31.1**				**C**

Signalized - Existing		2040 No-Build - AM Peak					2040 w/ Mitigation - AM Peak				
Intersection	Movement	Delay (sec)	50% Queue (ft)	95% Queue (ft)	v/c[1]	LOS[2]	Delay (sec)	50% Queue (ft)	95% Queue (ft)	v/c[1]	LOS[2]
Great Road & South Road	NB L	17.9	47	126	0.42	B	45.7	109	209	0.61	D
	NB TR	10.2	13	51	0.11	B	26.4	36	85	0.14	C
	SB LTR	39.6	94	241	0.71	D	65.6	188	407	0.78	E
	EB LTR	274.9	655	1526	1.54	F	-	-	-	-	-
	EB LT	-	-	-	-	-	22.3	412	315	0.83	C
	EB R	-	-	-	-	-	0.5	0	5	0.16	A
	WB LTR	35.6	198	712	0.80	D	10.5	87	211	0.53	B
	Total	**152.6**				**F**	**24.6**				**C**

Signalized - Existing		2040 No-Build - PM Peak					2040 w/ Mitigation - PM Peak				
Intersection	Movement	Delay (sec)	50% Queue (ft)	95% Queue (ft)	v/c[1]	LOS[2]	Delay (sec)	50% Queue (ft)	95% Queue (ft)	v/c[1]	LOS[2]
Great Road & South Road	NB L	28.8	140	403	0.79	C	68.9	213	368	1.00	F
	NB TR	12.0	33	96	0.17	B	16.1	47	89	0.21	B
	SB LTR	38.9	79	197	0.74	D	54.7	87	209	0.86	D
	EB LTR	136.9	435	1019	1.21	F	-	-	-	-	-
	EB LT	-	-	-	-	-	32.6	332	460	0.77	C
	EB R	-	-	-	-	-	2.4	0	6	0.03	A
	WB LTR	164.4	536	1190	1.28	F	44.3	324	683	0.94	D
	Total	**109.0**				**F**	**44.1**				**D**

8. Great Road & Fletcher Road

Unsignalized - Existing		2022 Existing - AM Peak				2022 Existing - PM Peak			
Intersection	Movement	Delay (sec)	95% Queue (ft)	v/c[1]	LOS[2]	Delay (sec)	95% Queue (ft)	v/c[1]	LOS[2]
Great Road & Fletcher Road	SB LTR	18.4	40	0.359	C	36.6	53	0.446	E
	EB LTR	0.3	3	0.027	A	0.8	5	0.074	A
	WB LTR	1.3	10	0.12	A	0.3	3	0.046	A
	Total	**2.3**				**2.2**			

Unsignalized - Existing		2029 Interim No-Build - AM Peak				2029 Interim w/ Mitigation - AM Peak			
Intersection	Movement	Delay (sec)	95% Queue (ft)	v/c[1]	LOS[2]	Delay (sec)	95% Queue (ft)	v/c[1]	LOS[2]
Great Road & Fletcher Road	SB LTR	15.6	23	0.23	C	15.6	23	0.23	C
	EB LTR	0.3	3	0.027	A	0.3	3	0.027	A
	WB LTR	1.3	10	0.118	A	1.3	10	0.118	A
	Total	**1.6**				**1.6**			

Unsignalized - Existing		2029 Interim No-Build - PM Peak				2029 Interim w/ Mitigation - PM Peak			
Intersection	Movement	Delay (sec)	95% Queue (ft)	v/c[1]	LOS[2]	Delay (sec)	95% Queue (ft)	v/c[1]	LOS[2]
Great Road & Fletcher Road	SB LTR	37.3	40	0.381	E	37.3	40	0.381	E
	EB LTR	0.8	8	0.079	A	0.8	8	0.079	A
	WB LTR	0.3	5	0.049	A	0.3	5	0.049	A
	Total	**1.7**				**1.7**			

Unsignalized - Existing		2040 No-Build - AM Peak				2040 No-Build - PM Peak			
Intersection	Movement	Delay (sec)	95% Queue (ft)	v/c[1]	LOS[2]	Delay (sec)	95% Queue (ft)	v/c[1]	LOS[2]
Great Road & Fletcher Road	SB LTR	17.9	28	0.277	C	75.5	78	0.613	F
	EB LTR	0.2	3	0.031	A	0.9	8	0.101	A
	WB LTR	1.4	13	0.146	A	0.3	5	0.055	A
	Total	**1.6**				**2.9**			

9. Great Road & Mudge Way

Signalized - Existing		2022 Existing - AM Peak					2022 Existing - PM Peak				
Intersection	Movement	Delay (sec)	50% Queue (ft)	95% Queue (ft)	v/c[1]	LOS[2]	Delay (sec)	50% Queue (ft)	95% Queue (ft)	v/c[1]	LOS[2]
Great Road & Mudge Way	NB LTR	45.9	82	99	0.67	D	34.6	44	179	0.54	C
	EB LTR	28.9	336	928	0.83	C	17.0	169	480	0.63	B
	WB L	13.8	23	104	0.51	B	7.1	12	53	0.26	A
	WB TR	7.4	89	271	0.41	A	18.2	229	851	0.84	B
	Total	**22.8**				**C**	**18.7**				**B**

Signalized - Existing		2029 Interim No-Build - AM Peak					2029 Interim w/ Mitigation - AM Peak				
Intersection	Movement	Delay (sec)	50% Queue (ft)	95% Queue (ft)	v/c[1]	LOS[2]	Delay (sec)	50% Queue (ft)	95% Queue (ft)	v/c[1]	LOS[2]
Great Road & Mudge Way	NB LTR	43.7	41	120	0.58	D	23.7	20	66	0.49	C
	EB LTR	22.4	322	1015	0.78	C	18.3	256	610	0.78	B
	WB L	8.9	16	76	0.49	A	7.9	13	44	0.48	A
	WB TR	5.3	62	249	0.38	A	3.5	50	113	0.37	A
	Total	**17.1**				**B**	**13.0**				**B**

Signalized - Existing		2029 Interim No-Build - PM Peak					2029 Interim w/ Mitigation - PM Peak				
Intersection	Movement	Delay (sec)	50% Queue (ft)	95% Queue (ft)	v/c[1]	LOS[2]	Delay (sec)	50% Queue (ft)	95% Queue (ft)	v/c[1]	LOS[2]
Great Road & Mudge Way	NB LTR	39.2	55	184	0.56	D	24.4	33	85	0.59	C
	EB LTR	17.1	188	509	0.65	B	12.3	150	317	0.58	B
	WB L	7.1	14	58	0.29	A	4.3	10	28	0.25	A
	WB TR	20.2	310	1163	0.87	C	13.8	212	653	0.82	B
	Total	**20.3**				**C**	**13.6**				**B**

Signalized - Existing		2040 No-Build - AM Peak					2040 w/ Mitigation - AM Peak				
Intersection	Movement	Delay (sec)	50% Queue (ft)	95% Queue (ft)	v/c[1]	LOS[2]	Delay (sec)	50% Queue (ft)	95% Queue (ft)	v/c[1]	LOS[2]
Great Road & Mudge Way	NB LTR	46.7	48	126	0.61	D	55.9	63	123	0.67	E
	EB LTR	33.7	511	1378	0.92	C	17.2	275	1095	0.83	B
	WB L	42.6	63	177	0.74	D	17.0	37	90	0.57	B
	WB TR	5.7	74	293	0.42	A	3.3	63	148	0.39	A
	Total	**27.0**				**C**	**15.3**				**B**

Signalized - Existing		2040 No-Build - PM Peak					2040 w/ Mitigation - PM Peak				
Intersection	Movement	Delay (sec)	50% Queue (ft)	95% Queue (ft)	v/c[1]	LOS[2]	Delay (sec)	50% Queue (ft)	95% Queue (ft)	v/c[1]	LOS[2]
Great Road & Mudge Way	NB LTR	61.1	97	195	0.76	E	40.4	62	120	0.68	D
	EB LTR	14.0	225	594	0.56	B	5.6	46	81	0.59	A
	WB L	6.0	15	61	0.28	A	3.7	13	19	0.28	A
	WB TR	23.7	531	1541	0.92	C	19.1	408	871	0.92	B
	Total	**22.7**				**C**	**15.6**				**B**

10. Willson Park/Rte 62 (Concord Road/North Road/Great Road)

Unsignalized - Existing		2022 Existing - AM Peak				2022 Existing - PM Peak			
Intersection	Movement	Delay (sec)	95% Queue (ft)	v/c[1]	LOS[2]	Delay (sec)	95% Queue (ft)	v/c[1]	LOS[2]
North Road & Concord Road (North)	NB L	102.7	198	0.96	F	379.5	498	1.68	F
	EB TR	0	0	-	-	0	0	-	-
	WB T	0	0	-	-	0	0	-	-
	Total	**11.7**			**B**	**63.2**			**F**

Unsignalized - Existing		2022 Existing - AM Peak				2022 Existing - PM Peak			
Intersection	Movement	Delay (sec)	95% Queue (ft)	v/c[1]	LOS[2]	Delay (sec)	95% Queue (ft)	v/c[1]	LOS[2]
North Road & Concord Road (South)	SB R	27.6	225	0.82	D	12.1	38	0.33	B
	EB LT	3.9	13	0.14	A	5.0	23	0.24	A
	WB T	0	0	-	-	0	0	-	-
	Total	**14.4**			**B**	**5.4**			**A**

Unsignalized - Existing		2022 Existing - AM Peak				2022 Existing - PM Peak			
Intersection	Movement	Delay (sec)	95% Queue (ft)	v/c[1]	LOS[2]	Delay (sec)	95% Queue (ft)	v/c[1]	LOS[2]
Great Road & Concord Road	NB L	-	-	-	-	-	-	-	-
	NB T	-	-	-	-	-	-	-	-
	SB T	-	-	-	-	-	-	-	-
	EB R	-	-	-	-	-	-	-	-
	Total								

Unsignalized - Existing		2029 Interim No-Build - AM Peak				2029 Interim w/ Mitigation - AM Peak			
Intersection	Movement	Delay (sec)	95% Queue (ft)	v/c[1]	LOS[2]	Delay (sec)	95% Queue (ft)	v/c[1]	LOS[2]
North Road & Concord Road (North)	NB L	104.2	195	0.96	F	104.2	195	0.96	F
	EB TR	0	0	-	-	0	0	-	-
	WB T	0	0	-	-	0	0	-	-
	Total	**11.5**			**B**	**11.5**			**B**

Unsignalized - Existing		2029 Interim No-Build - PM Peak				2029 Interim w/ Mitigation - PM Peak			
Intersection	Movement	Delay (sec)	95% Queue (ft)	v/c[1]	LOS[2]	Delay (sec)	95% Queue (ft)	v/c[1]	LOS[2]
North Road & Concord Road (North)	NB L	613.7	633	2.20	F	613.7	633	2.20	F
	EB TR	0	0	-	-	0	0	-	-
	WB T	0	0	-	-	0	0	-	-
	Total	**99.2**			**F**	**99.2**			**F**

Unsignalized - Existing		2029 Interim No-Build - AM Peak				2029 Interim w/ Mitigation- AM Peak			
Intersection	Movement	Delay (sec)	95% Queue (ft)	v/c[1]	LOS[2]	Delay (sec)	95% Queue (ft)	v/c[1]	LOS[2]
North Road & Concord Road (South)	SB R	20.5	148	0.71	C	20.5	148	0.71	C
	EB LT	3.9	13	0.15	A	3.9	13	0.15	A
	WB T	0	0	-	-	0	0	-	-
	Total	**10.2**			**B**	**10.2**			**B**

Unsignalized - Existing		2029 Interim No-Build - PM Peak				2029 Interim w/ Mitigation - PM Peak			
Intersection	Movement	Delay (sec)	95% Queue (ft)	v/c[1]	LOS[2]	Delay (sec)	95% Queue (ft)	v/c[1]	LOS[2]
North Road & Concord Road (South)	SB R	11.4	30	0.28	B	11.4	30	0.28	B
	EB LT	5.0	23	0.23	A	5.0	23	0.23	A
	WB T	0	0	-	-	0	0	-	-
	Total	**5.2**			**A**	**5.2**			**A**

Unsignalized - Existing		2029 Interim No-Build - AM Peak				2029 Interim No-Build - PM Peak			
Intersection	Movement	Delay (sec)	95% Queue (ft)	v/c[1]	LOS[2]	Delay (sec)	95% Queue (ft)	v/c[1]	LOS[2]
Great Road & Concord Road	NB L	-	-	-	-	-	-	-	-
	NB T	-	-	-	-	-	-	-	-
	SB T	-	-	-	-	-	-	-	-
	EB R	-	-	-	-	-	-	-	-
	Total								

Unsignalized - Existing		2040 No-Build - AM Peak (Unsignalized)				2040 w/ Mitigation - AM Peak (Signalized)				
Intersection	Movement	Delay (sec)	95% Queue (ft)	v/c[1]	LOS[2]	Delay (sec)	50% Queue (ft)	95% Queue (ft)	v/c[1]	LOS[2]
North Road & Concord Road (North)	NB L	242.2	300	1.32	F	78.3	160	268	0.81	E
	EB TR	0	0	-	-	-	-	-	-	-
	EB T	-	-	-	-	13.8	346	470	0.64	B
	EB R	-	-	-	-	0.9	0	9	0.39	A
	WB T	0	0	-	-	1.8	5	15	0.23	A
	Total	**25.0**			**C**	**14.6**				**B**

Unsignalized - Existing		2040 No-Build - PM Peak (Unsignalized)				2040 w/ Mitigation - PM Peak (Signalized)				
Intersection	Movement	Delay (sec)	95% Queue (ft)	v/c[1]	LOS[2]	Delay (sec)	50% Queue (ft)	95% Queue (ft)	v/c[1]	LOS[2]
North Road & Concord Road (North)	NB L	1049.2	783	3.13	F	58.1	176	314	0.87	E
	EB TR	0	0	-	-	-	-	-	-	-
	EB T	-	-	-	-	18.8	181	294	0.51	B
	EB R	-	-	-	-	0.9	0	17	0.18	A
	WB T	0	0	-	-	6.9	40	74	0.85	A
	Total	**159.2**			**F**	**16.7**				**B**

Unsignalized - Existing		2040 No-Build - AM Peak (Unsignalized)				2040 w/ Mitigation - AM Peak (Unsignalized)			
Intersection	Movement	Delay (sec)	95% Queue (ft)	v/c[1]	LOS[2]	Delay (sec)	95% Queue (ft)	v/c[1]	LOS[2]
North Road & Concord Road (South)	SB R	24.8	188	0.77	C	24.8	188	0.77	C
	EB LT	3.6	15	0.16	A	3.6	15	0.16	A
	WB T	0	0	-	-	0	0	-	-
	Total	**11.7**			**B**	**11.7**			**B**

Unsignalized - Existing		2040 No-Build - PM Peak (Unsignalized)				2040 w/ Mitigation - PM Peak (Unsignalized)			
Intersection	Movement	Delay (sec)	95% Queue (ft)	v/c[1]	LOS[2]	Delay (sec)	95% Queue (ft)	v/c[1]	LOS[2]
North Road & Concord Road (South)	SB R	12.1	35	0.32	B	12.1	35	0.32	B
	EB LT	5.0	25	0.26	A	5.0	25	0.26	A
	WB T	0	0	-	-	0	0	-	-
	Total	**5.2**			**A**	**5.2**			**A**

Unsignalized - Existing		2040 No-Build - AM Peak (Unsignalized)				2040 w/ Mitigation - AM Peak (Signalized)				
Intersection	Movement	Delay (sec)	95% Queue (ft)	v/c[1]	LOS[2]	Delay (sec)	50% Queue (ft)	95% Queue (ft)	v/c[1]	LOS[2]
Great Road & Concord Road	NB L	-	-	-	-	26.8	70	133	0.82	C
	NB T	-	-	-	-	4.0	70	40	0.23	A
	SB T	-	-	-	-	3.7	29	34	0.64	A
	EB R	-	-	-	-	9.4	0	62	0.56	A
	Total	**-**	**-**	**-**	**-**	**8.8**				**A**

Unsignalized - Existing		2040 No-Build - AM Peak (Unsignalized)				2040 w/ Mitigation - AM Peak (Signalized)				
Intersection	Movement	Delay (sec)	95% Queue (ft)	v/c[1]	LOS[2]	Delay (sec)	50% Queue (ft)	95% Queue (ft)	v/c[1]	LOS[2]
Great Road & Concord Road	NB L	-	-	-	-	9.0	64	80	0.52	A
	NB T	-	-	-	-	25.3	271	335	0.86	C
	SB T	-	-	-	-	4.3	17	23	0.51	A
	EB R	-	-	-	-	1.3	0	0	0.34	A
	Total	**-**	**-**	**-**	**-**	**15.4**				**B**

11. North Road/Rte 4 & Carlisle Road/Rte 225

Unsignalized - Existing		2022 Existing - AM Peak				2022 Existing - PM Peak			
Intersection	Movement	Delay (sec)	95% Queue (ft)	v/c[1]	LOS[2]	Delay (sec)	95% Queue (ft)	v/c[1]	LOS[2]
North Road & Carlisle Road	NB L	10.2	10	0.13	B	10.0	45	0.37	B
	NB T	0	0	-	-	0	0	-	-
	SB TR	0	0	-	-	0	0	-	-
	EB LR	47.7	48	0.43	E	125.3	40	0.43	F
	Total	**3.0**			**A**	**4.6**			**A**

Unsignalized - Existing		2029 Interim No-Build - AM Peak				2029 Interim w/ Mitigation - AM Peak			
Intersection	Movement	Delay (sec)	95% Queue (ft)	v/c[1]	LOS[2]	Delay (sec)	95% Queue (ft)	v/c[1]	LOS[2]
North Road & Carlisle Road	NB L	9.9	10	0.13	A	9.9	10	0.13	A
	NB T	0	0	-	-	0	0	-	-
	SB TR	0	0	-	-	0	0	-	-
	EB LR	45.8	50	0.44	E	45.8	50	0.44	E
	Total	**3.2**			**A**	**3.2**			**A**

Unsignalized - Existing		2029 Interim No-Build - PM Peak				2029 Interim w/ Mitigation - PM Peak			
Intersection	Movement	Delay (sec)	95% Queue (ft)	v/c[1]	LOS[2]	Delay (sec)	95% Queue (ft)	v/c[1]	LOS[2]
North Road & Carlisle Road	NB L	10.6	55	0.43	B	10.6	55	0.43	B
	NB T	0	0	-	-	0	0	-	-
	SB TR	0	0	-	-	0	0	-	-
	EB LR	220.2	58	0.65	F	220.2	58	0.65	F
	Total	**6.1**			**A**	**6.1**			**A**

Unsignalized - Existing		2040 No-Build - AM Peak				2040 w/ Mitigation - AM Peak (Roundabout)				
Intersection	Movement	Delay (sec)	95% Queue (ft)	v/c[1]	LOS[2]	Delay (sec)	50% Queue (ft)	95% Queue (ft)	v/c[1]	LOS[2]
North Road & Carlisle Road	NB L	10.6	13	0.15	B	-	-	-	-	-
	NB T	0	0	-	-	-	-	-	-	-
	NB TL	-	-	-	-	7.1	27	66	0.41	A
	SB TR	0	0	-	-	15.4	82	204	0.75	C
	EB LR	72.1	73	0.59	F	91.8	330	820	1.09	F
	Total	**4.4**			**A**	**36.5**				**E**

Unsignalized - Existing		2040 No-Build - AM Peak				2040 w/ Mitigation - AM Peak (Signal)				
Intersection	Movement	Delay (sec)	95% Queue (ft)	v/c[1]	LOS[2]	Delay (sec)	50% Queue (ft)	95% Queue (ft)	v/c[1]	LOS[2]
North Road & Carlisle Road	NB L	10.6	13	0.15	B	14.4	46	110	0.39	B
	NB T	0	0	-	-	8.2	153	219	0.30	A
	NB TL	-	-	-	-	-	-	-	-	-
	SB TR	0	0	-	-	15.0	375	619	0.67	B
	EB LR	72.1	73	0.59	F	49.9	222	345	0.91	D
	Total	**4.4**			**A**	**22.2**				**C**

Unsignalized - Existing		2040 No-Build - PM Peak				2040 w/ Mitigation - PM Peak (Roundabout)				
Intersection	Movement	Delay (sec)	95% Queue (ft)	v/c[1]	LOS[2]	Delay (sec)	50% Queue (ft)	95% Queue (ft)	v/c[1]	LOS[2]
North Road & Carlisle Road	NB L	11.7	73	0.51	B	-	-	-	-	-
	NB T	0	0	-	-	-	-	-	-	-
	NB TL	-	-	-	-	44.9	2613	6498	1.01	F
	SB TR	0	0	-	-	15.7	64	158	0.64	C
	EB LR	543.3	80	1.20	F	7.3	14.3	36	0.30	A
	Total	**10.4**			**B**	**33.4**				**D**

Unsignalized - Existing		2040 No-Build - PM Peak				2040 w/ Mitigation - PM Peak (Signal)				
Intersection	Movement	Delay (sec)	95% Queue (ft)	v/c[1]	LOS[2]	Delay (sec)	50% Queue (ft)	95% Queue (ft)	v/c[1]	LOS[2]
North Road & Carlisle Road	NB L	11.7	73	0.51	B	11.3	114	188	0.72	B
	NB T	0	0	-	-	5,4	135	249	0.54	A
	NB TL	-	-	-	-	-	-	-	-	-
	SB TR	0	0	-	-	21.5	179	400	0.55	C
	EB LR	543.3	80	1.20	F	17.8	13	80	0.70	B
	Total	**10.4**			**B**	**12.3**				**B**